

REMARKS

Applicants have amended claims 1 and 3 to more particularly point out and distinctly claim the subject matter of this application. Support for the amendment can be found at page 9, lines 16-20 of the specification. Applicants have also amended claim 4 to correct minor deficiencies. Claims 2 and 8-22 have been canceled.

The amendments should be entered as they raise no new issues that will require further consideration or search and also do not touch the merits of the application within the meaning of 37 C.F.R. § 1.116(b).

Claims 1 and 3-7 are currently pending. Reconsideration of the application, as amended, is requested in view of the remarks below.

Rejection under 35 U.S.C. § 103(a)

The Examiner rejected claims 1 and 3-7 under two grounds. Applicants traverse each ground as follows:

I

Claims 1, 3, 4, and 6 were rejected as being unpatentable over JP-A-55-145677 ("JP '677") in view of Oda et al., US Patent 4,316,965 ("Oda"). Claims 1 and 3, the independent claims, will be discussed first.

Claim 1 covers a ceramic article containing alumina (Al_2O_3), silica (SiO_2), and titania (TiO_2) in a total amount of at least 99% by weight. In the ceramic article, the alumina content is in the range of 70.0 – 99.5% by weight, the silica content is in the range of 0.06 – 12% by weight and the titania content is in the range of 0.08 – 30% by weight. The acid strength of the ceramic article is such that when it is exposed to a methyl red indicator of $\text{pK}_a +4.8$, the methyl red indicator changes color to its acid color. Thus, the ceramic article is **acidic**.

JP '677 discloses a **non-acidic** catalyst support containing a total content of alumina, silica, and titania. When the catalyst support is exposed to a methyl red indicator of $\text{pK}_a +4.8$, the methyl red indicator does not change color to its acid color. See the English translation of JP '677, page 2, lines 10-11. In other words, JP '677 does not teach or suggest an acid catalyst

support. Oda also does not teach or suggest an acidic ceramic article, either. It teaches a catalyst support having a small coefficient of thermal expansion, a high melting point, and a high mechanical strength; it is silent on acid strength of the catalyst support. See column 1, lines 6-8. Since neither JP '677 nor Oda teaches or suggests an acidic article, claim 1, which covers an acid article, is clearly not obvious over a combination of these two references.

Applicants submit that the rejection of claim 1 can also be overcome on a second and independent ground. Claim 1 covers a ceramic article having the alumina content in the range of 70.0–99.5% by weight, the silica content in the range of 0.06–12% by weight, and the titania content in the range of 0.08–30% by weight. JP'677 is silent on the relative amount of each component. Oda discloses a catalyst support having 6.5%-68% by weight alumina, 19-80% by weight titania, and 1 to 20% by weight silica.

The Examiner pointed out that:

“Oda teaches a maximum amount of 68% by weight, it would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to have optimized such alumina amounts to the desired amounts, such as the claimed amounts from 70.0-99.5% by weight...”
(see the Office Action, page 3, line 18 through page 4, line 4; emphasis added)

To obtain a catalyst support having favorable features, Oda discloses the amounts for the components of the support, i.e., 6.5%-68% by weight alumina, 19-80% by weight titania, and 1 to 20% by weight silica. Note that they are optimized amounts and reasons for these amounts are provided by Oda. According to Oda, a combination of alumina, titania, and silica beyond the amounts resulted in lack of one or more favorable features. See column 4, lines 19-48. For example, Oda points out that “if the addition of titania is not more than 19% by weight, ... the coefficient of thermal expansion rapidly increases to an excessively large range of $20 \text{ to } 80 \times 10^{-7}$ (1°C), so that at least 19% by weight [] titanium in terms of titanium oxide must be added.” See column 4, lines 40-47. Clearly, Oda does not suggest the amount of any component beyond the disclosed range. One of ordinary skill in the art therefore would not have been motivated by Oda to change the amount of alumina from 6.5%-68% to a different amount, let alone the amount

recited in claim 1, i.e., 70-99.5% alumina. Thus, Applicants submit that the prima facie obviousness has not been established and the rejection should be withdrawn.

Applicants now turn to claim 3. Claim 3 covers a method for producing such an acidic ceramic article. As discussed above, neither JP '677 nor Oda suggests an acidic ceramic article. Thus, a combination of JP '677 and Oda does not render claim 3 obvious.

For the reasons set forth above, claims 4 and 6, depending from claim 3, are also not obvious over JP '677 in view of Oda.

II

Claims 5 and 7 were rejected as being unpatentable over JP '677 in view of Oda and Nagase et al., US Patent 5,395,812 ("Nagase").

The patentability of claims 5 and 7, which depend from claim 3, resides at least in part in preparing an acidic ceramic article. Like JP '677 and Oda, Nagase does not suggest an acidic ceramic article. It discloses a catalyst having an α -alumina carrier and is silent on the acid strength of the α -alumina carrier. Since none of JP '677, Oda, and Nagase teaches producing an acidic ceramic article, a combination of these three references does not render obvious claims 5 and 7, each of which covers a method for preparing an acidic ceramic article.

CONCLUSION

For the reasons set forth above, Applicants submit that the grounds for the rejections asserted by the Examiner have been overcome, and that claims 1 and 3-7, as pending, define subject matter that is nonobvious over the prior art. Applicants therefore ask that all claims be allowed.

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Page : 7 of 7

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Respectfully submitted,

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